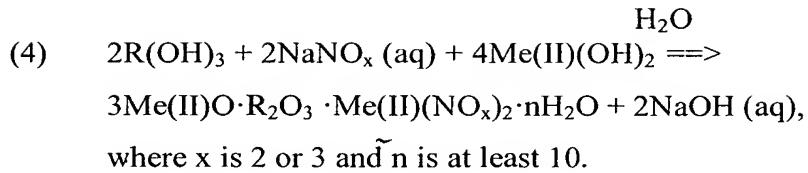
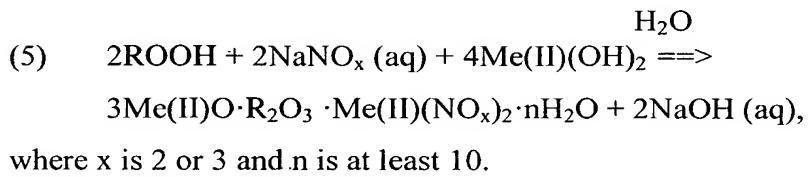


What is Claimed Is:

1. A method of immobilizing nitrate ions or nitrite ions in aqueous waste comprising the steps of :
 - 5 mixing the aqueous waste with a compound selected from the group consisting of Me(II)O and Me(II)(OH)₂ and a compound selected from the group consisting of 1) a compound having the formula Me(II)O·R₂O₃, and 2) a compound having the formula R₂O₃, R(OH)₃ or ROOH,
 - 10 where Me(II) is a cation selected from the group consisting of Ca, Ba, Sr, Mn, Zn and combinations thereof,
 - 15 R is selected from the group consisting of Al, Fe, Cr and combinations thereof;
 - 20 and allowing the waste to solidify.
 2. The method of Claim 1, wherein the following reaction immobilizes the nitrate ions or nitrite ions in the aqueous waste:
 - 15 (1)
$$2\text{Me(II)O}\cdot\text{R}_2\text{O}_3 + 2\text{NaNO}_x \text{ (aq)} + 2\text{Me(II)(OH)}_2 \xrightarrow{\text{H}_2\text{O}} 3\text{Me(II)O}\cdot\text{R}_2\text{O}_3 \cdot \text{Me(II)}(\text{NO}_x)_2 \cdot n\text{H}_2\text{O} + 2\text{NaOH} \text{ (aq)}$$
where x is 2 or 3 and n is at least 10.
 - 20 (2)
$$\text{Me(II)O}\cdot\text{R}_2\text{O}_3 + 2\text{NaNO}_x \text{ (aq)} + 3\text{Me(II)(OH)}_2 \xrightarrow{\text{H}_2\text{O}} 3\text{Me(II)O}\cdot\text{R}_2\text{O}_3 \cdot \text{Me(II)}(\text{NO}_x)_2 \cdot n\text{H}_2\text{O} + 2\text{NaOH} \text{ (aq)},$$
where x is 2 or 3 and n is at least 10.
 - 25 (3)
$$\text{R}_2\text{O}_3 + 2\text{NaNO}_x \text{ (aq)} + 4\text{Me(II)(OH)}_2 \xrightarrow{\text{H}_2\text{O}} 3\text{Me(II)O}\cdot\text{R}_2\text{O}_3 \cdot \text{Me(II)}(\text{NO}_x)_2 \cdot n\text{H}_2\text{O} + 2\text{NaOH} \text{ (aq)},$$
where x is 2 or 3 and n is at least 10.
 - 30 (4) The method of Claim 1, wherein the following reaction immobilizes the nitrate ions or nitrite ions in the aqueous waste:
 - 35 (5) The method of Claim 1, wherein the following reaction immobilizes the nitrate ions or nitrite ions in the aqueous waste:



6. The method of Claim 1, wherein the following reaction immobilizes the nitrate ions or nitrite ions in the aqueous waste:



7. The method of any one of Claims 1 through 6, wherein Me(II) is Ca.

8. The method of any one of Claims 1 through 6, wherein R is Al.
15 9. The method of any one of Claims 1 through 6, wherein Me(II) is Sr.

10. The method of any one of Claims 1 through 6, wherein R is Fe.

11. The method of any one of Claims 1 through 6, wherein Me(II) is Ca and R is Al.
20

12. The method of any one of Claims 1 through 6, wherein Me(II) is Ca and R is Fe.

13. The method of any one of Claims 1 through 6, where Me(II) is Sr.
25

14. The method of Claim 1, wherein the solidified waste is characterized as having a crystalline structure which entraps aqueous waste within the pore structure of the solid.

25 15. The method of any one of Claims 1 through 6, wherein Me(II)(OH)₂ is replaced by Me(II)O.

30 16. The method of any one of Claims 1 through 6, wherein the aqueous waste is low level nuclear waste.